PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

Due : 12, 27, 05
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PCT
Goudreau Gage Dubuc

INSCRIPTION

M.O.
VALIDATION

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	22 June 2005 (22-06-2005)
Applicant's or agent's file reference HM/11168.249	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CA2005/000285	25 February 2005 (25-02-2005)	27 February 2004 (27-02-2004)

International Patent Classification (IPC) or both national classification and IPC
IPC[7]: G01N 27/20, G01N 17/00, B02C 23/00

Applicant
MCGILL UNIVERSITY ET AL

1. This opinion contains indications relating to the following items :

[X]	Box No. I	Basis of the opinion
[ ]	Box No. II	Priority
[ ]	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
[ ]	Box No. IV	Lack of unity of invention
[X]	Box No. V	Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
[ ]	Box No. VI	Certain documents cited
[ ]	Box No. VII	Certain defects in the international application
[X]	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**
If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/CA	Date of completion of this opinion	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001(819)953-2476	19 May 2005 (19-05-2005)	Tung Nguyen (819) 956-3859

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   [X] the international application in the language in which it was filed

   [ ] a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of :

   a. type of material

      [ ] a sequence listing

      [ ] table(s) related to the sequence listing

   b. format of material

      [ ] on paper

      [ ] in electronic form

   c. time of filing/furnishing

      [ ] contained in the international application as filed.

      [ ] filed together with the international application in electronic form

      [ ] furnished subsequently to this Authority for the purposes of search.

3 [ ] In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statement that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments :

This opinion is established based upon the International Application as follows:

Description, pages 1-12, as originally filed.

Claims, 1-80, as originally filed.

Drawings, 1/9-9/9, as originally filed.

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-80	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-80	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-80	YES
	Claims	None	NO

2. Citations and explanations :

The following documents are considered to be the most relevant for this written opinion:

D1: US 4655077 (A)
D2: US 4884434 (A)

D1 discloses an apparatus for detecting a wearable condition of a component comprising a wear sensor probe having at least one conductive loop embedded within the component, and means coupled to the wear sensor probe for determining the continuity status of the conductive loop.

D2 discloses a wear sensor having a block containing one or more optical fibers for determining if a wear has occurred to the block, on the basis of a fact that the fibers have been severed on account of wear of the block.

The present invention discloses a sensor for detecting erosion of a wear surface of a component comprising a conductive element embedded in the component, the conductive element having a first end positioned at a first distance from the wear surface, a conductive loop comprising a wear portion positioned at a second distance from the wear surface proximate to the first end, and a circuit coupled to the conductive loop for determining a continuity of the conductive loop.

Novelty

Independent claims 1, 11, 25, 31 and 56 are considered to be novel (PCT Article 33(2)) as no single piece of prior art discloses the following features: a conductive element embedded in the component, where the conductive element having a first end positioned at a first distance from the wear surface (claim 1), at least one conductive trace on a substrate, where the substrate attached to the component such that a wearing portion of the trace between a first trace end and a second trace end comes within a predetermined distance from the wear surface (claim 11), at least one signal relaying loop embedded in the lifter and comprising a wear portion positioned at a wear distance from the wear surface (claims 25 and 31), and inserting a sensor comprised of at least one signal relaying loop in the at least one cavity such that a wear portion of the loop is positioned at a wear distance from the wear surface (claim 56).

Therefore, the subject matter of dependent claims 2-10, 12-24, 26-30, 32-55 and 57-80 is also considered to be novel (PCT Article 33(2)).

(See Supplementary Box)

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made :

The present set of claims does not meet the requirements of PCT Article 6 since it is not clear and concise in the following respect:

Claim 10 does not comply with PCT Article 6. The statement "said conductive element comprises a first conductive trace on said substrate and said conductive loop comprises a second conductive trace on said substrate" is not supported by the description.

"said first end" should be -- said first trace end -- (claim 11, line 7).

"said second end" should be -- said second trace end -- (claim 11, line 7).

The expression "the lifter" does not have proper antecedent (claim 25, line 5).

The description does not meet the requirements of PCT Article 5 since it is not sufficiently clear and complete in the following respect:

Page 1, line 6, of the description used the expression "incorporated by reference" which should be removed in order to comply with PCT Article 5 which requires that the patent specification be sufficiently clear and complete, and thus be self-contained and understood without reference to any other document.

There is an inconsistency in term used on pages 5 and 8 of the description of reference character 20 referring to as "a signal carrying loop" (page 5, line 9), "the loop" (page 5, line 13), "the signal relaying loop" (page 5, line 16), "the conductive loop" (page 8, line 26), and also "the element" (page 8, line 27).

"a lot if stress" should be -- a lot of stress -- (page 5, line 29).

"the filler material; 22," should be -- the filler material 22, -- (page 6, line 9).

"the opening 16 in the component" should be -- the opening in the component -- (page 8, lines 26-27).

The reference character 124 referring to "the trunnion" is not shown in figure 5 of the drawing.

The drawings do not meet the requirements of PCT Rule 11.13(l) on the fact that reference character not mentioned in the description shall not appear in the drawings, and vice versa:

Reference character 14' (figure 1B) and 114 (figure 5) of the drawing are not mentioned in the description.

"Fig. 1a" should be -- Fig. 1A -- (drawing 1/9). The same change must also be made to Fig. 1b (drawing 2/9).

"Fig. 6a" should be -- Fig. 6A -- (drawing 7/9). The same change must also be made to Fig. 6b-6d (drawing 7/9).

"Fig. 7a" should be -- Fig. 7A -- (drawing 8/9). The same change must also be made to Fig. 7b (drawing 8/9).

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**

Continuation of : Box No. V

Inventive Step

Documents D1 and D2 are considered to represent the most relevant state of the art, disclosing a wear sensor system for detecting erosion, corrosion and wear of a component and a wear sensor using optical fibres to determine the wear of a block. Neither one of these documents, when combined, discloses the features in claims 1, 11, 25, 31 and 56 of a sensor for detecting erosion of a wear surface of a component having a conductive element embedded in the component (claim 1), at least one conductive trace on a substrate (claim 11), at least one signal relaying loop embedded in the lifter comprising a wear portion (claims 25 and 31), and inserting a sensor having at least one signal relaying loop in the at least one cavity (claim 56). Therefore, the subject matter of claims 1, 11, 25, 31 and 56 do involve an inventive step (PCT Article 33(3)).

As a result, the subject matter of dependent claims 2-10, 12-24, 26-30, 32-55 and 57-80 also involve an inventive step (PCT Article 3(3)).

Industrial Applicability

The subject matter of claims 1-80 are considered to be industrially applicable (PCT Article 33(4)).